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# Developing and Validating a Type 2 Diabetic Patient Drug Telephone Reminder Program

Perpetua E. Okoh  
*Walden University*

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# Walden University

College of Health Sciences

This is to certify that the doctoral study by

Perpetua Okoh

has been found to be complete and satisfactory in all respects,  
and that any and all revisions required by  
the review committee have been made.

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Walden University

2015

Abstract

Developing and Validating a Type 2 Diabetic Patient

Drug Telephone Reminder Program

by

Perpetua Okoh

MS, F.N.P, California State University Long Beach, 2011

BS, University of Phoenix, 2008

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

November 2015

## Abstract

Research has shown that telephone drug reminder scripts can be an effective way to increase drug adherence and decrease health care costs for persons with Type 2 diabetes. The purpose of this project was to develop and validate a telephone drug reminder script for Type 2 diabetes patients based on evidence-based practice. Following a review of the literature, a telephone drug reminder script was developed for Type 2 diabetic patients to educate and improve drug adherence. Five local experts with at least 10 years' experience in diabetes treatment, education, and or research were asked to participate in the validation of the developed telephone drug reminder script. The 5 experts were placed in a quiet room and asked to review the developed telephone drug reminder script and complete an 18-question Likert-type survey on the design of the script, the content, and the process and time for completion. Each expert was given ample time to review and provide feedback on the developed telephone script. Descriptive analysis was used to analyze survey results. All local experts strongly agreed that the design was easy to follow and understand and that there was enough content to help improve Type 2 diabetic patient drug education and adherence. By improving drug education and adherence, 95% of the experts agreed that there would be a decrease in outpatient clinic visits for diabetic management. Revisions to the telephone drug reminder script were made based on the survey analysis. The validated telephone script will be used in a pilot study compared with standard of care in the future. The validated evidence-based telephone drug reminder script for Type 2 diabetic patients has the potential to improve patient outcomes and reduce health care costs for those living with Type 2 diabetes.

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## Dedication

My Doctor of Nursing Practice (DNP) project is dedicated to Mr. Godfrey Okoh, my late father, whom I miss dearly for his inspiration and for imparting to me the importance of education. I miss you dad at this point in my life and may your soul rest in perfect peace, AMEN! Also, Ms. Mercy Okoh, my late sister, who died at the tender age of 23 after completing her BS in accounting. Sister may your soul rest in perfect peace AMEN! God bless.

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## Section 1: Nature of the Project

### **Introduction to the Study**

The prevalence of diabetes remains high and continues to climb. Blackburn, Swidrovich, and Lemstra predicted, "The global prevalence of diabetes would increase by approximately 65% over the next 20 years from an aging population and rising obesity rates all across the world" (2013, p. 183). According to Blackburn et al., this phenomenon is a major concern for governments worldwide as well as for the health insurance industry as patients with type 2 diabetes suffers from multiple co-morbid conditions more frequently compared to patients without the disease. This chapter discusses the need to address practice problems connected with type 2 diabetes as they relate to nursing practice. A successful outpatient management program might lower macrovascular and microvascular complications significantly.

For this reason, doctors prescribe the concurrent use of drugs by patients who are older or have multiple risk factors (Antoine, Pieper, Mathes, & Eikermann, 2014). According to Antoine et al. (2014), oral drugs play a significant role in diabetes care. Poor adherence to oral diabetes drugs results in severe health complications and increased mortality.

Jimmy and Jose (2011) suggested that problems with medication compliance are the result of multiple factors, such as the patient's outlook and attitudes, the nature of the sickness, affordability, and provider issues. Drug adherence is central to positive outcomes. It is also central to "the quality of the

provider/patient relationship” (Jimmy & Jose, p. 155). According to Jimmy and Jose, provider/patient communication is significantly related to “positive outcomes of care, patient satisfaction, health status, and drug adherence” (p. 155). During discussions with providers, patients are helped to understand their illness and the risks and benefits of treatment. Patients with type 2 diabetes often lack the knowledge or ability to adhere to a drug regimen. For multidisciplinary healthcare teams involved in patient care, it is important to identify strategies to improve drug adherence and ensure consistent drug intake. However, the reasons for drug non-adherence can be difficult to identify (Vrijens et al., 2012). This prompted the development and validation of telephone reminder script to assist drug adherence in type 2 diabetes patients.

### **Problem Statement**

The incidence of diabetes has escalated, along with nonadherence to medication, lack of knowledge, lack of self-management, and inadequate health literacy. Managing patients with diabetes is a significant challenge for health systems as well as healthcare providers at every level of development (Deerochanawong & Ferrario, 2013).

Blackburn et al. (2013) stated that the continuously increasing diagnosis of type 2 diabetes creates an urgent threat to people’s health and the survival of many hospitals globally (p. 183). According to Antoine et al. (2014), several drug prescriptions play a prominent management role in type 2 diabetes. Blackburn et al. (2013) noted that various drugs play a significant role in managing the signs and symptoms of diabetes.

Noncompliance with therapeutic medications is increasingly associated with high incidences of morbidity, mortality, and health care costs (p. 183).

The development and use of a validated script can be used to address the problem of noncompliance and contribute to the existing research. Non-compliant patients were often hesitant to communicate any related side effects from prescribed medications to their care team or physicians. A primary component of healthcare quality is efficient management of diabetes through the patient's adherence to prescribed drugs. Aliha et al. (2013) reported that diabetes drug patient adherence had a significant effect on diabetic patients' metabolic control. Drug therapy adherence was a primary determinant of treatment success; good drug adherence is associated with improved clinical outcomes, and poorer adherence has been shown to correlate with increased adverse events for patients with chronic conditions. Therefore, arguable that drug adherence was critical in reducing the risk of diabetes complications.

Shrivastava, Shrivastava, and Ramasamy (2013) suggested that patients with diabetes mellitus face various obstacles to drug adherence. These barriers were a combination of patient and health system factors (Jimmy & Jose, 2011). However, well-controlled trials were limited to confirm and resolve these obstacles (Shrivastava et al., 2013). Thus, it was critical for healthcare providers to understand the diabetic patients' related psychosocial issues.

There were relatively high levels of non-adherence in all areas of self-management behaviors. This nonadherence was due to self-management behaviors that

required changes in the patient's daily life. Despite interventions such as patient education, diabetes continued to be a highly prevalent chronic condition with high levels of treatment for non-adherence (Poolsup, Suksomboon, & Kyaw, 2013). An understanding of the psychosocial issues enhanced the nursing process implementation by providers, which leads to quality assessment, diagnosis, planning, and evaluation of diabetic patients (Poolsup et al., 2013).

### **Purpose Statement**

The telephone drug reminder messaging script consists of a standardized messaging script that outlines and structures phone calls to participants and generates data regarding drug adherence. Traynor (2012) reported that patients with chronic conditions such as diabetes only adhered to between 50% and 60% of medications prescribed by the provider. Using a modified Delphi method, this research project developed and implemented a validated telephone drug reminder messaging script. Following the initial development of drug reminder protocol, five experts reviewed and provided feedback on the proposed program.

### **Project Objectives**

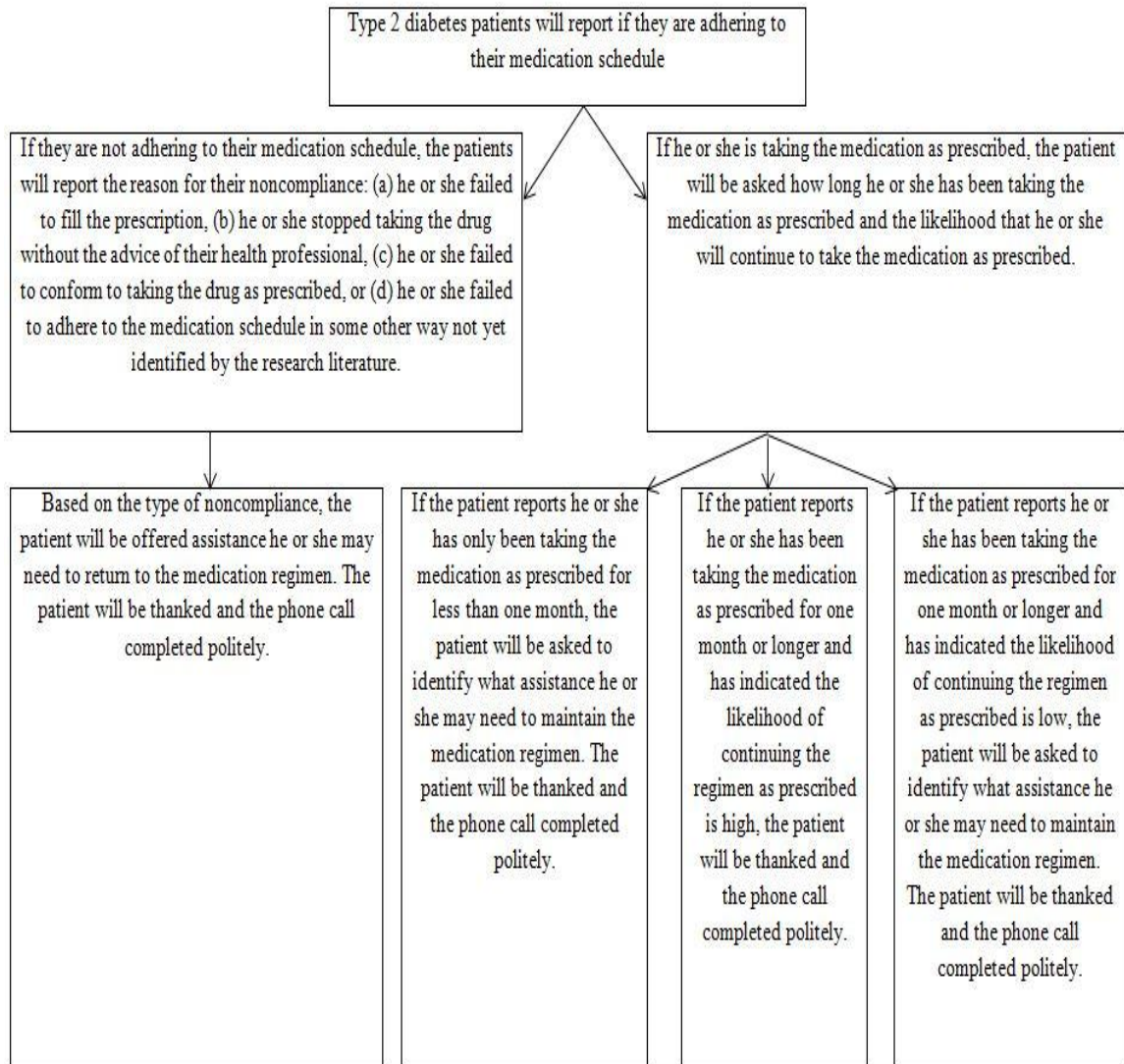
The primary project goal was development and validation of a telephone drug reminder messaging script for type 2 diabetes patients based on current evidence-based practice literature using a modified Delphi study approach (Jimmy & Jose, 2011). The telephone protocol consisted of (a) a standardized script and (b) alternate responses based on potential patient responses. Research on patients' compliance with hospital

appointments has shown that patients with high incidences of nonadherence to their drug regimen improved significantly as a result of telephone follow-up reminders and text messages compared to patients with no call reminders (Gurol-Urganci, de Jongh, Vodopivec-Jamsek, Atun, & Car, 2012).

According to Jimmy and Jose (2011), there are several types of non-adherence. The first is primary nonadherence or non-fulfillment adherence because drug prescriptions are not filled; the second was non-persistence adherence because prescription drugs intake stopped without the advice of health professionals. Non-persistence was usually not intentional but was a result of miscommunication between patient and provider about therapeutic plans. The third was non-conforming adherence. Nonconforming adherence includes a variety of ways in which patients fail to take prescription drugs ranging from missing doses, skipping doses, or choosing not take the prescription drug by the physician. These types of non-adherence had negative consequences for patients.

Research has been conducted on drug intake of the targeted type 2 diabetes populations and has shown some patients forget to take their drugs. For example, Jimmy and Jose (2011) reported "that 49.6% of patients mentioned forgetfulness as one of the major nonintentional reasons for non-adherence" (p. 158). The telephone drug reminder messaging script was designed to remind patients to take their drugs and to investigate the effect of a diabetes nurse educator using a telephone messaging script to call type 2

diabetes patients about adherence to medication. The primary measurable objective for this project was if the script met the guidelines as established by experts (see Figure 1).



*Figure 1.* Telephone-centered program protocol outline.



### **Project Question**

The primary research question (RQ1) addresses the problem statement as follows:

Will an efficient and effective telephone drug reminder messaging script improve drug adherence for type 2 diabetes patients?

According to Kardas, Lewek, and Matyjaszczyk (2013), in ensuring patients were compliant with oral anti-diabetic drugs prescribed, they monitored their blood glucose, which were significant concerns identified related to type 2 diabetes treatment.

Nonadherence with diabetes drugs is a frequent problem that negatively impacts patient outcomes. The success of patient care is dependent on the availability of medical care, a proactive administrator, and health resources (Traynor, 2012).

The purpose of the research project was the development and validation of a telephone drug reminder messaging script using a modified Delphi study approach. Following the initial development of drug reminder protocol, five experts reviewed and provided feedback on the proposed program. The telephone drug reminder messaging script is comprised of a standardized messaging script that outlined and structured the phone calls to participants and generated data regarding drug adherence (Walker et al., 2011). The purpose the script was to:

1. Identify if type 2 diabetes patients were adhering to their medication schedule.
  - a. If they were not adhering to their medication schedule, the patients were asked their reason for noncompliance.

- b. If they were adhering to their medication schedule, the patient was asked how long they took the medication as prescribed and the likelihood that they would continue to take their medication as prescribed.
2. Once their adherence (or lack of adherence) was identified, the patients were provided additional information to assist them to return to the medication regimen or ensured the patient continued the medication regimen.

Once patient adherence or lack of adherence is identified, the patients would be assisted with additional information to help manage their diabetes. Diabetes is a challenging disease to manage successfully. According to Mahfouz and Awadalla (2011), patients must follow a self-management regimen that involves frequent self-monitoring of blood glucose (SMBG), dietary control, exercise, and medication administration in order to maintain adequate glycemic control. Education and health care providers input are essential; and "Collaboration and negotiation with healthcare providers, family members, and others are essential so that such behavior changes are optimally supported and encouraged" (p. 39). Additionally, using validated reminder tools, the nurse diabetes educator also provides adequate education and advocacy for patients to ensure safe and quality care.

### **Conceptual Model and Theoretical Framework**

For the purposes of this project, Orem's self-care deficit theory was applied along with the health belief model (HBM) of Guo, Lin, Chen, Kao, and Chang (2013). The deficit theory is a grounded theory that provides the theoretical framework for the project.

(See Appendix A and Appendix B.) The grounded theory application was developed by studying nurse-patient interaction regarding drug intake reminder and was compared against the constant comparative method, a challenging method (Maijala, Paavilainen, & Astedt-Kurki, 2004). Orem's model of self-care focused on the needs of individuals and promoted dignity, respect and empowerment. The theory is based on the assumption that people wanted to take care of themselves (Guo et al., 2013). Application of Orem's nursing theory and standardized nursing language enhanced communication among nurses and supported client's ability to self-manage a chronic illness such as diabetes (Kumar, 2007). The use of telephonic or computerized devices in health management promotes effective patient care outcomes, communication, and participation in diabetes treatment. While some patients prefer in-person contact, others have been found to like the telephone or computerized devices for managing their diabetes. (King et al., 2012).

The theoretical framework potentially motivated participants to adhere to drug regimens and monitor their blood glucose. Telephone follow-ups allowed the nurse educator to collaborate one-on-one with the individual about medication adherence and glucose monitoring. The Orem's self-care deficit theory defined self-care as the activities conducted by the patient to maintain their health, and self-care was very crucial for patients with diabetes type 2, as it reduces complications.

A proper and functioning self-care program required clear and relevant information and instructions from the healthcare givers (Guo et al., 2013, p. 21).

According to Maijala et al. (2004), educational intervention had a positive and significant impact on extended health model belief constructs and increased self-efficacy in patients with type-2 diabetes. In addition, the HBM model was used in various population groups, had the potential to empower patients with diabetes, and prepare patients to manage their health. Furthermore, the HBM model was very useful in explaining noncompliance, making an educational diagnosis, and designing compliance-enhancing interventions (Bayat et al., 2013). In addition, according to Jalilian, Zinat, and Gharibnavaz (2014), diabetes treatment outcomes rely on patient behavior and medication adherence, which are vital to diabetic management.

The purpose of the script is gather data on patients not adhering to their medication schedule, and the reason behind the patient's noncompliance to their medication intake. The outcome is to improve management of diabetes adherence.

### **Nature of the Project**

The evidence-based research project used a modified Delphi study approach to develop and validate a telephone drug reminder messaging script. Following the initial development of drug reminder protocol, five experts reviewed and provided feedback on the proposed program. The telephone drug reminder messaging script is comprised of a standardized messaging script that outlines and structures the phone calls to participants and generates data regarding drug adherence (Walker et al., 2011).

Carper (1978) identified four fundamental patterns of knowing in nursing: experimental, moral, individual, and artistic. Fawcett, Watson, Neuman, Walker, and Fitzpatrick (2001) expanded on nursing theories and evidence, theoretical factual descriptions of events, explanations of phenomena, and predictions. Fawcett et al., in describing the strong link that exists among theory, inquiry, and evidence, explained that in nursing, personal knowing is the honest communication and relationship between each nurse and his or her patient. According to Fawcett et al., each pattern of knowing and type of theory and mode of inquiry provides diverse sources of data for evidence-based nursing practice. Different nursing theories provided different lenses for reviewing and interpreting the different evidence essential for theory-guided, evidence-based, holistic nursing practice (p. 119).

For this project's purpose, the development of a telephone protocol assisted type 2 diabetes patients adhered to their medication regimen. It drew on the researcher's and the experts' (participants') empirical, ethical, personal, and aesthetic knowledge.

### **Definition of Terms**

The definitions of terms outlined below are provided to clarify the meaning of the terminology in the DNP project.

*Medication adherence:* Medication adherence is the extent to which individuals took drugs that have known health benefits (Blackburn et al., 2013).

*Medication nonadherence:* Medication nonadherence refers to drugs incorrectly taken or not taken, potentially jeopardizing the patient's therapeutic outcome (Blackburn et al., 2013).

*Psychosocial behavior:* Psychosocial behavior is the state of development of how patients interact and react to social surroundings to identify their concerns and fears related to their health status (Blackburn et al., 2013).

*Type 2 Diabetes Mellitus:* Type 2 diabetes mellitus is a metabolic disorder associated with blood glucose elevations (Blackburn et al., 2013).

### **Assumptions, Limitations, and Delimitations**

#### **Assumptions**

Patients do not comply with medication adherence (Traynor, 2012). Most providers had no telephone drug intervention messaging script. However, it was assumed that most providers do care whether their type 2 diabetes patients followed their medication regimen and that they considered a cost-effective intervention program worthwhile to keep their patients in better health. It further assumed if a telephone intervention program were implemented that type 2 diabetes patients would improve their adherence to their medication regimen.

#### **Limitations**

The project was limited by the researcher's ability to develop an initial telephone script that was sufficient in scope to be the foundation for a successful telephone intervention program. The results were also limited by the experts' knowledge and

willingness to share their time to create a successful telephone intervention program. Experts had believed the program had the potential for success and they wanted to contribute meaningfully to its development.

### **Scope and Delimitations**

Five experts were recruited to evaluate the efficacy of the telephone protocol: (a) two family practice doctors, (b) two nurse practitioners, and (c) one RN diabetic educator. To be eligible for participation in the proposed study, each expert required more than 10-year's treatment, education, or research diabetes experience.

### **Significance**

The project significance was the ability of the diabetes nurse educator to enhance diabetes patients to become more proficient in adhering to the drug regimen. The future contributions from this project could potentially strengthen the nursing practice, improve patient outcomes, and reduce costs for those living with diabetes using an evidence-based information tool for patient adherence to diabetes drugs.

The healthcare provider's role in managing diabetic patients involves disseminating tools needed by patients for self-management and for improving drug adherence, blood glucose monitoring, and diabetes outcomes. The provider interventions using telephone follow-up reminders and evidence-based education with report card benchmarking and clinical support systems significantly increase drug compliance in diabetic patients.

In the face of rising costs and an economic downturn, healthcare providers must practice cost containment. Cost containment is a major concern because hospital administrators and clinicians seek to reduce healthcare costs without compromising the quality of care (Stabile et al., 2013). The project outcomes were to increase the health of diabetics, decrease the cost of caring for diabetic patients, and to help identify possible barriers for drug non-adherence.

### **Evidence-Based Significance of the Project**

The importance of this project was using evidence-based approaches to increase collaboration with diabetes patients. Translating evidence-based research into practice improved drug adherence and clinical outcomes. The evidence significance is wasteful when not used or hidden in publications. The research problem was developed to focus on the evidence-based practice of enhanced compliance of diabetes patients' in taking drugs, and the first step solution was the conversion of evidence from studies into clinical practice guidelines (Terry, 2012).

Evidence-based approaches promoting patient-centered care using telephone reminder-based interventions such as follow-up calls improved adherence to a daily drug regimen. In this project, the program interventions were designed to meet the patient's needs for quality healthcare by following up with diabetes patients to make sure they adhered to the drug regimen.



## **Reduction of Gaps**

The script purpose was to gather data on patients not adhering to their medication schedule and the reasons behind their noncompliance. Research has indicated that suggested glycemic goals were attained in fewer than 50% of diabetic patients due to nonadherence to medication. Serious diabetic symptoms can lead to early death, greater morbidity, and high health services costs. Nonadherence is a complex phenomenon attributable to maturity, information, perception and length of disease, difficulty of establishing dosing regimens, numerous treatments, emotional factors, security, acceptability, and expenditure ( - , 2013). Numerous gaps remain in the information needed to support proper management of medication adherence (Vrijens et al., 2012). The expected outcome of this project was to mitigate the data gap in the management of diabetes adherence.

## **Implications for Social Change in Practice**

The social changes in practice are to promote and to increase efficiency by reducing healthcare costs. Diabetes-related complications decreased with an active telephone follow-up process that facilitated ongoing support for individuals because healthcare providers needed an effective and efficient support of *health-care consumers'* adherence to medication. The amounts of information, encouragement, and support conveyed to participants using telephone follow-up reminders helped health-care consumers (Liang et al., 2011).

When the program was implemented, it began promoting programmatic, as well as societal change, using telephone reminders to increase medication adherence in diabetes patients. This is considered project advance policy. This program has the potential to increase medication adherence in type 2 diabetes patients ( - et al., 2013). Liang et al. (2011) reported a mobile phone intervention provided a statistically noteworthy development in patient glycemic control and promoted individual diabetes management, in particular for type 2 diabetes patients (p. 463).

Future contributions from this project may enhance the nursing practice using a telephone reminder follow-up for increased medication adherence in type 2 diabetes patients; increased medication adherence decreased costs and complications.

### **Summary**

Numerous evidence-based studies established the significance of drug adherence by diabetes patients. The project purpose was to develop and validate a telephone drug reminder messaging script for type 2 diabetes patients based on current evidence-based practice literature. The protocol consisted of (a) a standardized script and (b) alternate responses based on potential patient responses. Following the development of the telephone drug reminder messaging script protocol, five experts, two family practice doctors, two nurse practitioners, and one RN diabetic educator reviewed and provided feedback on the proposed program.

Section 2 of the DNP project study includes diabetes treatment literature reviews including thorough research and understanding of the importance of drug adherence by type 2 diabetes patients. The following section also includes a discussion of the theoretical framework that served as the foundation of the study. Section 3 includes a presentation of the research approach and strategies.

## Section 2: Review of Literature

Multiple forms of literature were reviewed, including peer-reviewed journals, publications, and articles on type 2 diabetes management, including scholarly and professionally recognized medical databases. The database search included Google Scholar, National Guideline Clearinghouse, PubMed, Medline(OvidSP), CINAHL(EbscoHOST), the Cochrane Database, Communication & Mass Media Complete (CMMC), ERIC, International Pharmaceutical Abstracts (IPA), PsycARTICLES, PsycINFO (OvidSP), Nursing Research: Generating and Assessing Evidence for Nursing Practice and Community and Public Health Nursing: Evidence for Practice. The search included two websites from the ADA and CDC. The search focused on diabetes evidenced based research publications related to an analysis of patient adherence to drugs and blood sugar monitoring. The search of these peer-reviewed articles was performed over a three-month period using electronic databases as the primary source for gathering data (Walker et al., 2011).

A second peer-reviewed literature review was conducted using the Boolean network. The Boolean network literature review included more than 50 peer-reviewed articles. The keywords used in this search were *adherence*, *nonadherence*, *diabetes mellitus*, *evidence-based practice*, *diabetes drug adherence*, and *glucose monitoring*.

### **Specific and General Literature**

The project purpose was to develop and validate a telephone drug reminder messaging script for drug adherence targeted at type 2 diabetes patients. The pilot study

was used to compare a new validated telephone reminder program with the current practice (Cheng, Chen, & Tseng, 2013). The literature review provided and outlined evidence-based research and evidence-based practices incorporating factors that supported patients' adherence to drug and blood sugar monitoring.

Adherence to prescribed drugs was a single-minded dimension of healthcare quality ( - et al., 2013). The purpose of the script was to gather data on patients not adhering to their medication schedule. Monitoring medication adherence is an ongoing process; the longer patients are on a drug, the more likely they will have difficulty following the drug regimen. According to - et al. (2013), only 32% people who were on oral hypoglycemic drugs were nonadherent, for an average of 64.7 days in one year.

Type 2 diabetes adherence medication regimens is strongly associated with metabolic control, interventions such as telephone follow-up reminders related to monitoring and improving adherence are critical. Telephone follow up interventions can advance adherence to everyday medications. Conversely, supplementary realistic interventions ought to be considered to determine their worthiness in improving patient adherence and treatment outcomes (Fenerty, West, Davis, Kaplan, & Feldman, 2012).

Patient drug adherence is central to drug regimen outcomes and to the quality of the provider/patient relationship. Jimmy and Jose (2011) stated, that provider/patient communication is positively related to care outcomes, patient satisfaction, health status, and drug adherence. Discussions with providers help patients understand their illness and

the risks and benefits of treatment. Identifying drug adherence strategies for improving medication adherence is the responsibility of multidisciplinary healthcare teams involved in patient treatment. Type 2 diabetes patients may lack the knowledge or ability to adhere to a drug regimen. Conversely, the reasons for drug nonadherence can be difficult to identify (Vrijens et al., 2012). However, according to Kardas, Lewek, and Matyjaszczyk (2013), monitored blood glucose to ensure patients were compliant with prescribed oral antidiabetic drugs. Even though, nonadherence was a frequent problem, optimal diabetes care are achievable if providers collaborated with patients in managing diabetes.

Useful approaches to diabetic patients included scheduled follow-up calls to assist patients in adhering to drug and blood sugar monitoring ( - et al., 2013). This telephone follow-up reminder approach was shown to increase medication adherence and blood glucose monitoring in diabetes patients. Telephone reminders to diabetes type 2 patients considered for use in the project program to assist various patient populations improved adherence to medications (Vervloet, van Dijk, Santen-Reestman, van Vlijmen, Bouvy, & de Bakker, 2011). Structured telephone support and telemonitoring are effective in reducing the risk of mortality and CHF-related hospitalizations, improving the quality of life, reducing of costs, and providing evidence-based prescribing (Inglis et al., 2010).

### **Summary**

Healthcare providers' follow-up calls used to provide behavioral support to patients helped monitor medication adherence and blood glucose monitoring (Jimmy &

Jose, 2011). In addition, providers' enhanced collaboration with patients to incorporate the drug regimen and blood sugar control into their daily regimen.

### Section 3: Methodology

To evaluate the problem addressed, the researcher focused on the collaboration among community groups and stakeholders. Based on the problem identified within the community, the groups collaborated to create a plan to evaluate the needs assessment. When mapping out the needs assessment and evaluation plans, it was important to recognize available resources in advance (Hodges & Videto, 2011). A critical component to determine the planning process required a theoretical understanding of the needs assessment (Kettner, Moroney, & Martin, 2013).

#### **Project Design**

The project purpose was developing and validating a telephone drug reminder messaging script for type 2 diabetes patients. Following the initial development of the drug reminder protocol, five experts reviewed and provided feedback on the proposed program. The telephone drug reminder messaging script is comprised of a standardized messaging script, which outlines and structures phone calls to participants and generates data regarding drug adherence (Walker et al., 2011).

According to Jimmy and Jose (2011), there are several types of non-adherence. The first is primary nonadherence or nonfulfillment adherence because drug prescriptions were not filled. The second type is because prescription drug intake stopped without the advice of health professionals. Nonpersistence was usually not intentional but was a result of miscommunication between patient and provider about therapeutic plans. A third type is known as nonconforming adherence. Nonconforming adherence included a



variety of ways in which patients fail to take prescription drugs, ranging from missing, skipping, or choosing not take the drug prescribed by a physician. The purpose the telephone script was to

1. Identify if type 2 diabetes patients were adhering to their medication schedule.
  - a. If they were not adhering to their medication schedule, the patients were asked their reason for noncompliance.
  - b. If they were adhering to their medication schedule, the patients was asked how long they took the medication as prescribed and the likelihood that they will continue to take their medication as prescribed.
2. Once their adherences (or lack of adherence) were identified, the patients were provided additional information to assist them to return to the medication regimen or ensure they would continue the medication regimen.

The evidence-based research project used a modified Delphi study approach to develop and validate a telephone drug reminder messaging script. A Delphi study is a research process designed to generate ideas and agreement from experts within a particular field (Kennedy, 2004). For this study, a panel of experts reached consensus about the efficacy of the telephone script. It was not necessary for participants to meet using the Delphi method.

The panel of experts for the proposed study included medical doctors, nurse practitioners, and an RN diabetic educator. The panelists received e-mail notices to join the project study. Panel members' concurrence was expected after three rounds of

feedback. In a Delphi study, anonymity between panelists was necessary (Kennedy, 2004). The panel members saw no comments made by other members but received the corrected script after each round.

### **Population and Sampling**

The project purpose was developing and validating a telephone drug reminder messaging script for type 2 diabetes patients. The project targeted population included family practice doctors, nurse practitioners, and RN diabetes educators who deal directly with type 2 diabetes patients. Five experts were geographically close to the researcher and met minimum qualifications were recruited to evaluate the efficacy of the telephone protocol. The experts included (a) two family practice doctors, (b) two nurse practitioners, and (c) one RN diabetic educator. To be eligible for participation in the proposed study, each expert must have had more than 10 years of treatment, education, or research diabetes experience.

### **Data Collection**

The project purpose was developing and validating a telephone drug reminder messaging script for type 2 diabetes patients based on current evidence-based practice literature. The protocol consisted of (a) a standardized script and (b) alternate responses based on potential patient responses. Prior to data collection from the five experts, the researcher developed a draft introduction of the caller to the patient and a request for information about their adherence to their medication schedule. Part 2 consisted of a discussion based on their response to the first question (see Figure 1). Patients were asked

about their noncompliance medication schedule or how long they took the medication as prescribed. Based on the response, the patients were given additional recommendations (see Figure 1).

Once the script was complete, data collection began with the five experts. Each expert received a copy of the script and asked to provide written suggestions and revisions based on the protocol outlined for the telephone-centered program. Suggestions and changes were consolidated into a revised script and the process repeated until the five experts agreed that the script successfully met the protocol, and patients were expected to respond positively.

Communications with the panelists were by e-mail. Each panelist received instructions on the modified Delphi process and the first draft of the script sent via e-mail to each panelist. Panelists were asked to submit their feedback on the script within five days. Suggested revisions made by the panel were incorporated into the script for the second and third round. Each time responses were submitted; the document was revised and resubmitted to the panel. Once the project was approved, it was sent for Walden Institutional Review Board (IRB 05-01-15-0420103) approval because the project purpose was validation of newly developed program, and informed consent was not necessary.

Qualitative and quantitative research methods were important factors in research data analysis. Both methods are robust and display the utmost quality of realistic learning in healthcare (Marshall & Rossman, 2006). Quantitative and qualitative research

demonstrates the best research evidence for summation of the highest current empirical knowledge in a particular healthcare setting (McEwen & Wills, 2011). Quantitative research was vital to create the body of knowledge needed for evidence-based practice (McEwen & Wills, 2011).

According to Marshall and Rossman (2006), qualitative researchers focused on a systematic approach to describing life experiences. Based on the project question, a qualitative research design was used. The qualitative research approach was applicable because participants provided rich textural data in the form of feedback regarding the efficacy of the telephone protocol.

### **Project Evaluation Plan**

The project consisted of two steps: (a) development of a script for telephone drug reminder messaging script and (b) assessment and feedback of the script by professional experts. The first step was completed when the initial script met the steps outlined in the protocol draft. The second step was completed when the five experts agreed that the script had the potential to keep type 2 diabetes patients on their medication regimen successfully for at least one additional week beyond the telephone reminder.

### **Reliability and Validity**

Validity and reliability were necessary to ensure credible, consistent, and accurate data obtained during the data collection process (Marshall & Rossman, 2006). Validity (Silverman, 2005) is necessary to establish the integrity of a study (Golafshani, 2003). According to Marshall and Rossman (2006), four constructs established validity. They

are (a) the credibility or believability of a study; (b) transferability, which indicated the usefulness of the results; (c) dependability, or the ability of other researchers to replicate the results, and (d) conformability. Neuman (2003) noted the importance of a study's authenticity, or the researcher's ability to provide an unbiased account of the participants' experiences. Lincoln and Guba (1985) noted that reliability was synonymous with dependability in qualitative studies.

### **Triangulation**

Because results from qualitative research are replicable (Marshall & Rossman, 2006; Neuman, 2003), researchers use alternative methods to ensure reliability and validity. The use of multiple data sources, or in the case of this study, numerous experts, gave credence to the results (Marshall & Rossman, 2006). Five professional experts provided multiple sources of data and each reviewed the document three times, twice after the document was adapted based on expert feedback. This process reduced bias in the study and increased reliability and validity.

### **Summary**

The assessment of a telephone drug reminder messaging script for patients with diabetes enhances drug adherence. The phone follow-up reminder mobile phone intervention led to statistically significant improvement in glycemic control and self-management in diabetes care, especially for Type 2 diabetes patients (Liang et al., 2011). In addition, a successful telephone reminder project and management of diabetes lead to decreased healthcare costs for patients (Cheng et al., 2013). Evidence-based practice

demonstrated best practice in implementing safe and quality care and met patients' outcomes by assessing patient psychosocial barriers.

## Section 4: Findings, Discussion, and Implications

### **Summary of Findings**

The developed and validated TDRP Messaging Script evidence-based tool will enable healthcare providers to use the new evidence-based tool, and it would aid nurse educators to communicate drug intake importance to targeted type 2 diabetic patients. Furthermore, the tool encompassed the key project primary measurable objectives (see Figure 1) for evaluating compliance and noncompliance with drug intake. The intended outcomes identify (a) increased drug intake adherence, (b) what assistance is needed to maintain the drug intake, (c) reduced type 2 diabetes complications, and (d) implied extended healthy life for type 2 diabetes patients through drug intake adherence.

The project purpose was achieved by the development and validation of the TDRP messaging script based on Orem's model of self-care focused on the needs of individuals and promoted dignity, respect and empowerment. The theory is based on the assumption that people wanted to take care of themselves (Guo et al., 2013). Application of Orem's nursing theory and standardized nursing language enhanced communication among nurses and supported client's ability to self-manage a chronic illness such as diabetes (Kumar, 2007). The use of telephonic or computerized devices in health management promotes effective patient care outcomes, communication, and participation in diabetes treatment. While some patients prefer in-person contact, others have been found to like the telephone or computerized devices for managing their diabetes (King et al., 2012).

The Orem's self-care deficit theory defined self-care as the Activities carried out by the individual to maintain their health and self-care was very crucial for patients with diabetes type 2 as it reduces complications. A proper and functioning self-care program required clear and relevant information and instructions from the healthcare givers. (Guo et al., 2013, p. 21)

These theoretical frameworks potentially motivated participants to adhere to drug regimens and monitor their blood glucose levels. This conceptual framework lends support to TDRP messaging script that allows the nurse educator to collaborate one-on-one with the individual about medication adherence and glucose monitoring. The TDRP Messaging Script was developed as a resource tool. The script also provides an objective resource to nursing educator and health caregivers of diabetes patients. In addition, the script addresses public health issues and serves as another evidenced based tool in diabetes management toward drug intake adherence.

### **Summary Discussion**

The TDRP Messaging Script development and validation encompassed review of evidenced-based literature, designed Likert-type survey questionnaires, identification of diabetes experts, including the multiple script revisions by five local experts before script validation, and descriptive analysis and presentation of survey results. Likert survey questionnaires were used to elicit feedback from five local experts on 18 questions. The validation of the messaging script was based on descriptive criteria (content, process,



design, time, and overall rating of messaging script) developed for ready descriptive analysis of expert's feedback (See Appendix C).

The experts feedback data descriptive evaluation showed 100% ( $n = 5$ ) of all local experts who participated in this reviews and validation assessment strongly agreed to the final revised script. They *strongly agreed* the final messaging script content was *helpful*. This increased patient rate of drug adherence and decreased patient visits to their doctors. The experts opined on the script utility for patients and the recommendation of the script to providers. They strongly agreed the script experience was helpful in guiding them through the content, and strongly agreed that the script was easy to read and helpful in understanding the content. Last, the time spent on the multiple script reviews was time well spent; and they would recommend the use of this telephone drug reminder messaging script to other providers.

The literature review findings identified poor adherence to oral diabetes medications that may result in severe health complications and increased mortality (Antoine et al., 2014). Furthermore, the multidisciplinary healthcare team responsibility involved identifying drug adherence strategies to ensure efficient drug intake management. The patients often lack the knowledge or ability to adhere to a drug regimen. However, the reasons for drug non-adherence are difficult to identify (Vrijens et al., 2012).

In addition, the literature review provided and outlined evidence-based research and evidence-based practice to incorporate factors that will support patients' adherence to

drug and blood sugar monitoring. Findings from the study revealed adherence to prescribed drugs is an essential element of healthcare quality (Cheng et al., 2013). The findings informed me about the development of the TDRP and validated by five local experts in the field of diabetes.

The TDRP implementation is a planned future pilot study. The study outcome compared to current standard practice. The local experts validated TDRP outcomes supported the purpose of the DNP project that TDRP will increase drug adherence and blood glucose monitoring in diabetes patients. Successful diabetes' care is achievable if providers collaborate with patients in managing diabetes.

Useful approaches to diabetic patients include scheduled follow-up phone calls to assist patients in adhering to drug and blood sugar monitoring ( - et al., 2013). The TDRP development and validation exemplified the fact that collaboration often leads to success. The expert outcomes validated the drug adherence program by increasing medication adherence and blood glucose monitoring in diabetes patients.

### **Implications**

#### **Policy**

Doctor of Nursing Practice (DNP) graduates have to be aware of the regulations (Mund, 2011) that guide their area of specialty or practices. Their understanding will enable them to avoid the unethical pitfalls along their effort to implement any new-evidenced based practice at their practicing settings. The ethical principle is critical to the

fruitful and efficient implementation of EBP. The ethical principle also prevents any confidentiality issues (Burns & Grove, 2009).

The future application of the TDRP Messaging Script will take into consideration the issue of confidentiality. An advocate DNP nurse requires an understanding of nursing legislation and clinical knowledge to support effectively for new laws and the betterment of the nursing profession. The ultimate goal of influencing the manner providers organized delivered and provided public care.

### **Practice**

The promotion of TDRP Messaging Script provides another alternative approach to meeting diverse needs by type-2 diabetes patient population. While some patients prefer in-person contact, the use of telephonic or computerized devices health management promotion has been shown to lead to effective patient care outcomes, communication, and greater patient participation in diabetes management (King et al., 2012).

The TDRP Messaging Script was developed as a resource tool for nurse educators and health caregivers. The tool is also addresses this public health issue. In addition, TDRP Messaging Script allowed the nurse educator to collaborate one-on-one with the patient about medication adherence and glucose monitoring.

### **Research**

Evidenced based practice (EBP) is a term identifying research programs and practices successful and proven to enhance the care of patients. The implications will

involve a DNP-prepared nurse using professional judgment to translate research into practice in conformance to EBP empirical and ethical standards. Disseminating an evidenced based practice (EBP) tool, such as the TDRP Messaging Script, would help bridge the gaps and barriers to effective drug adherence by type 2 diabetes patients' population. The Telephone Drug Reminder Messaging Script would be implemented as a future clinical project, to gather data on adherence based on the TDRP messaging script; and validated in a clinical setting for practice change.

### **Social Change**

The promotion of TDRP Messaging Script would enhance proper care for the affected type 2 diabetes population. The TDRP Messaging Script project was developed and validated by five local experts based on current evidence-based practice literature findings, that used a modified Delphi study approach (Jimmy & Jose, 2011). The project significance is the ability of the diabetes nurse educator to educate diabetes patients to become more proficient in adhering to the drug regimen. The project purpose relied on the Orem's self-care deficit theory defined as the

Activities carried out by the patient to maintain their health and self-care was crucial as it reduces complications for type 2 diabetes patients. A proper and functioning self-care program required clear and relevant information and instructions from the healthcare givers. (Guo et al., 2013, p. 21)

## **Project Strengths and Limitations**

### **Strengths**

Future implementation of this project is considered strength. The TDRP Messaging Script is easy to access, decreases caring cost for diabetic patients, and help identify possible barriers to drug non-adherence (Polit & Beck, 2012). As such, a telephone drug reminder messaging script can support and encourage communication between the healthcare provider and patient as they share this teaching and learning experience to improve diabetic patient's care. Furthermore, the TDRP Messaging Script implementation is a planned future pilot study.

The study outcome was compared to current standard practice. Upon provider recommendation and interpretation, the pilot study outcome will determine if it can improve standardization within the telephone reminder field (American Diabetes Association, 2014). In addition, evidence-based research was limited regarding the clinical outcomes of a TDRP follow-up call with the type 2 diabetes patient populations (Grove, Gray, & Burns, 2014). The initiating implementation proposal would address if TDRP follow-up calls increased medication adherence for the type 2 diabetes patients population.

### **Limitations**

The DNP project limitation was scant research on telephone drug reminder programs for type 2 diabetes patient population needs and expectations (Grove et al., 2014; Polit & Beck, 2012). It was difficult to predict drug adherence for type 2 diabetic

patients, and the barriers and challenges associated with providing self-care drug adherence information to type 2 diabetes patient population.

### **Recommendations for Remediation of Limitations in Future Work**

The recommendations for remediation of limitations include (a) maintaining an ongoing outreach educational program on the burden of non-adherence to a type 2 diabetic patient, (b) encouraging drug adherence, (c) providing timely prevention measures for patients at risk, and (d) reinforcing the needs and benefits for making healthy choices and healthy living. In addition, a constant literature review and update of the telephone drug reminder program is recommended.

### **Analysis of Self**

My self-analysis is based on my educational qualifications, certifications, and work experiences. In addition, my profession as a professional nurse skilled and knowledgeable in multiple specialized areas of nursing practices. My nursing educational qualifications are (a) ADN RN, (b) bachelor of science in nursing, (c) master's in nursing and specialization in healthcare education, and (d) continuing student for the doctorate of nursing degree. My post-master's in nursing certifications: (a) family nurse practitioner, (b) clinical nursing specialist adult care, and (c) clinical nursing educator. My work experiences include (a) public health nurse, (b) telephonic nursing, (c) nurse practitioner, (d) clinical nurse specialist, and (e) clinical instructor/medical surgery registered nurse.

The development and validation of the TDRP Messaging Script project relied heavily on my educational and work experiences. These experiences helped in identifying

the research question, project objective, problem statement, the design of the protocol, and analysis of findings. Furthermore, my nursing educational scope relied on and complied with the American Association of Colleges of Nursing (AACN), DNP Essentials 1-VIII, and the Institute of Medicine hallmark (IOM) reports (IOM, 1999, 2001, 2003). The IOM recommended

Focused attention on the state of health care delivery, patient safety issues, health professions education, and leadership for nursing practice. These reports highlighted the human errors and financial burden caused by fragmentation and system failures in health care. In addition, the IOM calls for a dramatic restructuring of all health professionals' education. The IOM recommendations stated that the health care organizations and groups promote safe, effective, client-centered, timely, efficient, and equitable health care. That health professionals educated deliver patient-centered care, as members of an interdisciplinary team, emphasized evidence-based practice, quality improvement, and informatics. Moreover, included the best prepared senior level nurses occupied key leadership positions and participate in executive decisions. (AACN, 2014, p. 5)

The DNP degree was designed specifically to prepare individuals for a specialized nursing practice. It compares to “The Essentials of Doctoral Education for Advanced Nursing Practice” (p. 7) that articulated the competencies for all nurses practicing at this level (AACN, 2014). The DNP Essentials I-VIII, with nursing educational and

professional experiences were applied, as related to being a scholar, a practitioner, and a project developer, respectively.

My education and professional skills are instructor advanced cardiac life support, monitor technician/EKG arrhythmia, hemodynamic monitoring, phlebotomy/intravenous therapy, management of aggressive behavior, certified lactation educator, and legal nurse consultant. My clinical experiences and knowledge satisfied both AACNs essentials and IOM report's recommendations. In addition, I learned and gained insight on type 2 diabetes effect on the community to develop and validate the TDRP messaging script.

#### **As Scholar**

My educational scholarly qualifications and professional experience prepared me for success in nursing academia and research as a scientist. I gained and acquired a multidisciplinary nursing knowledge as a skilled clinician and educator that met and satisfied both AACN essentials and IOM report's recommendations. As a DNP scholar and public health nurse, I gained health evaluation, teaching, and counseling experience as a case manager of individual families with type 2 diabetes patients.

As a telephonic nurse, through home visits, clinic visits, and telephone consultations, I gained interactive, interpersonal, interdisciplinary skills, and knowledge in case management. In addition, I have experience in prenatal and postpartum care, child healthcare, and communicable disease control with high-risk adult follow-up and family planning services.



Furthermore, as a clinical nurse specialist, I learned and conducted research, gained knowledge and became skilled as a problem solver of various patients health problems. My professional experiences met and satisfied (a) Essential I, Scientific Underpinnings for Practice (AACN, 2014) and (b) Essential VIII, Clinical Scholarship and Analytical Methods for Evidence-Based Practice (AACN, 2014). The IOM report's recommendations to promote healthcare and deliver patient-centered care as members of an interdisciplinary team emphasizing evidence-based practice, quality improvement, and informatics (AACN, 2014).

### **As Practitioner**

My educational qualification and professional experiences prepared me for success in nursing academia and research as a scholar; I gained and acquired a multidisciplinary nursing knowledge as a skilled clinician and educator that met and satisfied both AACN essentials and IOM report's recommendations. As a DNP practitioner and nurse practitioner, I gained clinical skills and knowledge in health prevention and health maintenance, physical exams, and diagnoses and treatment plans. I prescribed limited medications under physician supervision and counseled patients and families.

Moreover, I gained and developed a clinical ability to assess, plan, implement, and evaluate evidence-based programs. As a clinical nurse specialist, I learned and conducted research, and I gained knowledge and skill as a problem solver of various patients' health problems. My practitioner professional experiences met and satisfied

Essential V, Health Care Policy for Advocacy in Health Care (AACN, 2014), and Essential VI, Interprofessional Collaboration for Improving Patient and Population Health Outcomes (AACN, 2014). Including, Essential VII, Clinical Prevention and Population Health for Improving the Nation's Health (AACN, 2014), and Essential VIII, Clinical Scholarship and Analytical Methods for Evidence-Based Practice (AACN, 2014).

In addition, I met and satisfied the IOM report's recommendations to promote healthcare and to deliver patient-centered care, emphasized evidence-based practice, quality improvement, and informatics (AACN, 2014). I have managed ranges of identified health issues by prompt screening in the community for non-drug adherence for type-2 diabetes patients. Other DNP practice role benefits are promoting healthy diet, exercise, safety, and stress management.

My CNS/NP professional experiences met and satisfied Essential V, Health Care Policy for Advocacy in Health Care (AACN, 2014) and Essential VI, Interprofessional Collaboration for Improving Patient and Population Health Outcomes (AACN, 2014). In addition, Essential VII, Clinical Prevention and Population Health for Improving the Nation's Health (AACN, 2014) and Essential VIII, Clinical Scholarship and Analytical Methods for Evidence-Based Practice (AACN, 2014) as well as the IOM report's recommendations to promote healthcare and to deliver patient-centered care, emphasized evidence-based practice, quality improvement, and informatics (AACN, 2014).

As a DNP practitioner graduate, I gained clinical nursing and leadership experiences, both applicable and satisfactory to the essentials identified. The experiences prepared and enabled me to design, influence, and implement healthcare policies that frame healthcare financing, practice regulation, access, safety, quality, and efficacy (AACN, 2014; IOM, 2001, 2003). My experiences allowed me to design, implement, and advocate for healthcare policy that address issues of social justice and equity in health care.

I was enabled to integrate nursing practice experiences with policy process analysis and the ability to engage in politically competent action (AACN, 2014; O'Grady, 2004). I was prepared to facilitate collaborative team functioning and overcome impediments to the interprofessional practice. I played a central role in establishing interprofessional teams and analyzed epidemiological, biostatistical, occupational, and environmental data for the development, implementation, and evaluation of clinical prevention and population health.

As a DNP practitioner, nurse practitioner, I claim to have the competency to contribute, identify, and solve health issues. Further, as a CNS with DNP education, I can function and practice in healthcare policy changes or any other changes needed to improve healthcare delivery in any setting. The advanced training and knowledge gained empowered me to develop the TDRP Messaging Script. The TDRP promotes EBP drug adherence for type 2 diabetes patients initiatives based on drug adherence improvement.

### **As Project Developer**

As a DNP project developer, PHN, and CNS, dealing with various types of diseases and morbidity within my community district guided me to develop a TDRP Messaging Script. The script is intended to promote EBP drug adherence for type 2 diabetes patients. I developed and validated the Telephone Drug Reminder Program Script to promote EBP drug adherence for type 2 diabetes patients and to finalize my DNP capstone requirements completion. Doctor of Nursing Practice (DNP) graduates are prepared to participate in a practice setting and multi-disciplinary teams.

The TDRP Messaging Script development involved five local experts validation of TDRP Messaging Script. TDRP required significant time between student, local experts, and preceptor to develop and validate a scholarly TDRP Messaging Script product ready for dissemination. In addition, my TDRP Messaging Script would be pending publication via electronic medium and recognized national nursing journals upon DNP program completion. As a project developer, I have gained and acquired knowledge from developing the messaging script that would be helpful to me in future project development.

### **Future Project Professional Development**

The TDRP Messaging Script developed was a requirement to satisfy the DNP degree completion. The focus was to develop TDRP Messaging Script used to promote EBP drug adherence in type 2 diabetes patients. The messaging script primary goal was to develop a telephone drug reminder messaging script for type 2 diabetes patients based

on current evidence-based practice literature using a modified Delphi study approach (Jimmy & Jose, 2011).

The TDRP Messaging Script was a community-based project that may enhance the ability of the diabetes nurse educator to increase diabetes patients to become more proficient in adhering to the drug regimen. The future professional contributions could potentially strengthen the nursing practice and management of type 2 diabetes patients. According to Needleman et al. (2011), this may lead care improvement and cost reduction using the TDRP tool for patient adherence to diabetes drugs.

### **Summary and Conclusions**

The prevalence of type 2 diabetes lead to a creation of a Telephone Drug Reminder Program (TDRP) developed and validated by five local experts in the field of diabetes (See Table 1). A planned future pilot study will be compared to the newly approved TDRP with current standard practice. Doctor of Nursing Practice (DNP) CNS has a significant role to play to help address the management and burden of type 2 diabetes. As a management tool, TDRP was developed to prevent drug non-adherence and increase drug adherence in type 2 diabetes patients, and advance nursing practice to address the public health issue (Rigsby, 2011). Moreover, the TDRP is culturally applicable as an educational tool to (a) manage nutrition and sustainable physical activity, (b) as after-intervention support, and (c) to produce practical results with improved outcomes of type 2 diabetes management.

This project goal was developing and validating a TDRP to prevent drug non-adherence and increase drug adherence in type 2 diabetes patients. The TDRP Messaging Script provides an objective resource to nursing educator and healthcare givers to manage type 2 diabetes. The project purpose was achieved by the development and validation of TDRP messaging script based on Orem's model of self-care, which focuses on the needs of individuals and promotes dignity, respect, and empowerment. The theory is based on the assumption that people wanted to take care of themselves (Guo et al., 2013). My TDRP messaging script completion is a major phase of the DNP degree and the ultimate doctoral education goal that both demonstrate combined student's work and knowledge for future professional development.

The survey questionnaire purpose is to review and validate a standardized script by five local experts. The experts provide feedback by completing a Likert-type scale survey. Below is the descriptive analysis of the data. The anchors on the Likert scale ranged from 1 (*strongly disagree*), to 5 (*strongly agree*), with a neutral category.

One hundred percent ( $n = 5$ ) of all local experts who participated in this reviews and validation assessment strongly agreed with the final revised script.

Questions 1, 2, 3, and 18 were specifically designed to seek information that established if the final revised script satisfied its intended purpose and learning objectives. That is related to overall satisfaction, importance, readability, and likeness of the telephone drug reminder program. The Questions 4, 5, and 6 focus is to assess the

script effect on (a) decreasing rate of drug misses, (b) increasing rate of drug adherence, and reduced rate of doctor's visits.

Questions 7, 8, 9, 10, and 16 focused local experts (personal) opinion on the utility of script to their patients, the recommendation to another, and advice to healthcare providers. It included disagreement to any section of the script and the script content understanding. Questions 11, 12, 13, and 17 focus is to determine the script design adequacy, utility, and ease of understanding. In addition, Questions 14 and 15 were open-ended qualitative questions to establish any script design weakness and strength of the standardized script that outlines and structures the phone messaging script.

### **Expert Evaluation Data**

**Content.** Questions 1, 2, 3, and 18 were used to address the standardized script content specifically. The five local experts ( $n = 5$ ) reported, *Strongly Agreed* that the final script content properly addressed and assisted them in understanding the need for drug adherence (100%). For questions 5 to 10, the five local experts ( $n = 5$ ) *Strongly Agreed* that the final content was *helpful* to increase the rate of drug adherence, and to decrease patient visits to a doctor. The experts commented on the script utility for patients, to the recommendation of the script to another, and providers. However, one expert (20%) reported *Neutral* and questioned if the messaging script would decrease the patient rate of drug misses without the inclusions of deaf disable diabetic patients. One expert (20%) reported *Neutral* and questioned the script structure and design without considering disabled diabetic patients.

**Process.** Question 16 was used to address the script messaging process. Five local experts (100%) *Strongly Agreed* the script experience was helpful in guiding them through the content.

**Design.** Questions 3 and 17 were used to address the script messaging design. Five local experts (100%) *Strongly Agreed* that the script was easy to read and helpful in understanding the content.

**Time.** The five local experts addressed the time spent on the script's multiple reviews was time well spent, as such none of the experts (0%) felt they needed to comment.

**Overall.** Questions 1 and 18 were meant to identify the five local expert's full rating of the script and if they would recommend it to others or providers seeking a telephone drug reminder messaging script. One hundred percent ( $n = 5$ ) of the five local experts commented they would recommend the use of this telephone drug reminder messaging script to another or providers.

### **Qualitative Questions**

**Strengths.** The quality of the final script content noted by all five local experts' respondents (80%) *Huge* and helped to understand the telephone drug reminder program messaging script purpose. One expert (20%) reported "Neutral" and addressed the need for script information inclusive of disabling deaf patients (Expert #3).

**Weaknesses.** The five local experts' comments varied. One expert (20%) addressed the need for information inclusive of disabling deaf patients with type-2



diabetes. In addition, another expert (20%) questioned if the script decreases a patient rate of drug misses without the inclusion of disabling deaf patients and if the messaging script is tailored to each patient.

## Section 5: Scholarly Product

### **Developing and Validating a Type 2 Diabetic Patient Drug Telephone**

#### **Reminder Program**

##### **Manuscript for Publication**

Dissemination is a significant aspect of development and validation of evidence-based tool, which enable healthcare providers to use the new evidence-based tool. Furthermore, it acts as an aid to nurse educators providing drug intake to targeted type 2 diabetic patients. My hope and plan are submitting my developed and validated TDRPMS manuscript to all nationally recognized seminars organizations, and medical and nursing journals, such as the Journal of Nursing Association and the American Diabetes Association. As a professional membership holder of the California Association of Clinical Nurse Specialists, Sigma Theta-Tau Honor Society, and Oncology Nursing Society, I would also disseminate my developed and validated TDRPMS manuscript to these organizations. In the future, the TDRP messaging script would be implemented as a pilot study comparing the validated developed telephone reminder program by five local experts to standard practice (Funnell et al., 2010), and the results would be published.

##### **Project Summary and Evaluation Report**

The developed and validated TDRP Messaging Script evidence-based tool will enable healthcare providers to use the new evidence-based tool, and it would aid nurse educators to communicate drug intake importance to targeted type 2 diabetic patients. Furthermore, the tool encompassed the key primary measurable objectives (See Figure 1)

to evaluate compliance and noncompliance drug intake. The intended outcomes were (a) increased drug intake adherence, (b) identify assistance needed, (c) reduce type 2 diabetes complications, and (d) extend a healthy life for type 2 diabetes patients through drug intake adherence.

The project purpose was achieved by the development and validation of TDRP messaging script, based on Orem's model of self-care, which focuses on the needs of individuals and promoted dignity, respect, and empowerment. The theory is based on the assumption that people wanted to take care of themselves (Guo et al., 2013).

Application of Orem nursing theory and standardized nursing language enhanced communication among nurses and supported client's ability to self-manage a chronic illness such as diabetes (Kumar, 2007).

Telephonic or computerized devices use in health management promotes effective patient care outcomes, communication, and participation in diabetes treatment, and management. However, some patients preferred in person contact; and others liked telephonic or computerized devices for managing and deciding their diabetes (King et al., 2012).

Orem's self-care deficit theory defined self-care as the Activities carried out by the individual to maintain their health and self-care was very crucial for patients with diabetes type 2 as it reduces complications. A proper

and functioning self-care program required clear and relevant information and instructions from the healthcare givers. (Guo et al., 2013, p. 21)

The TDRP Messaging Script was developed as a resource tool and provides an objective resource to nursing educator and health caregivers to diabetes patients. In addition, the script is used to address public health issues and serves as another evidenced based tool in diabetes management toward drug intake adherence.

### **Program Evaluation Report**

The TDRP report focused on the qualitative question of strength and weaknesses of the Likert-like survey questions evaluated by five local experts. The evaluation report (Appendix C) determined program strength and the quality of the final script content noted by all five local experts' respondents (80%) was *Huge*. In addition, it helped to understand the telephone drug reminder messaging script purpose. One expert (20%) reported “Neutral” and addressed the need for script information "inclusive of disabling deaf patients” (Expert #3).

The five local experts' comments varied concerning the program weakness. One expert (20%) addressed the need for information inclusive of disabling deaf patients with type-2 diabetes. In addition, another expert (20%) questioned if the script decreases the patient rate of drug misses without the inclusion of disabling deaf patients and if the messaging script was tailored to the patient. The TDRP evaluation report exemplified the fact that collaboration often leads to success. The drug adherence program validated by

experts supported increased medication adherence and blood glucose monitoring in diabetes patients.

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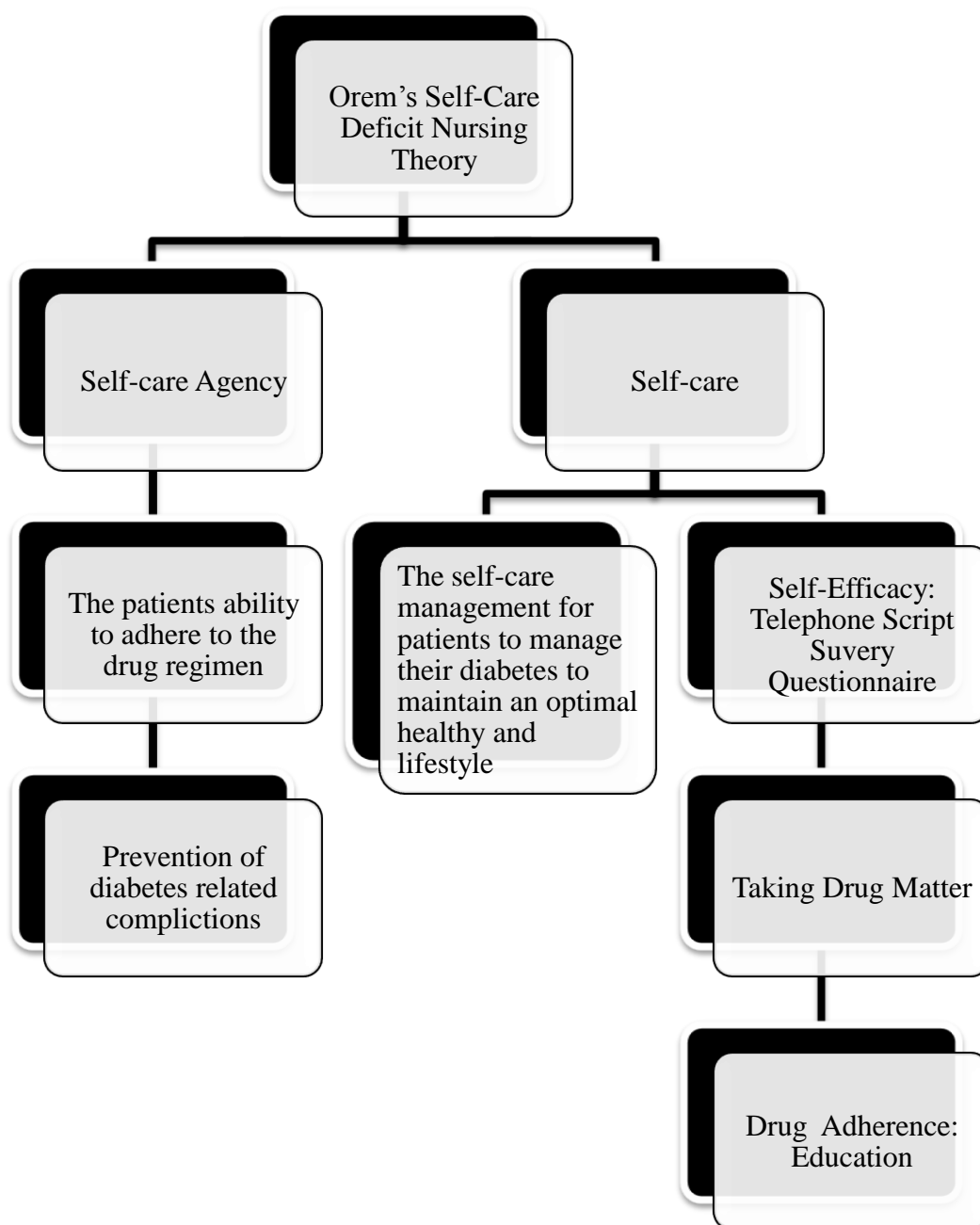
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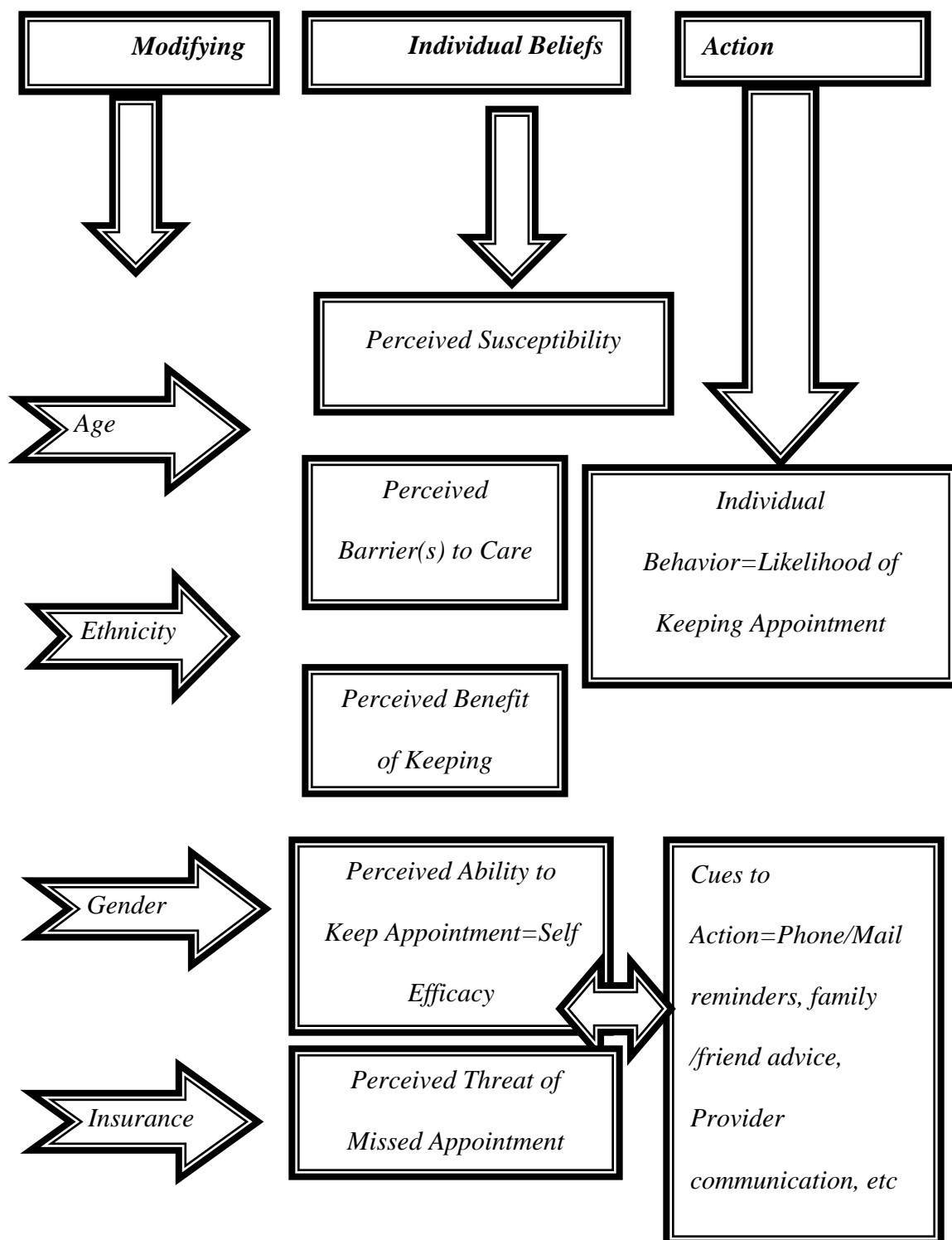
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## Appendix A: Orem's Self-Care Deficit Nursing Theory Modified



## Appendix B: Adaptation of Health Belief Model



### Appendix C: Expert Survey Questionnaire

1. Overall, how satisfied are you with the design of this telephone script?
2. Does the script convey the importance of drug Adherence?
3. How is the readability of the medication adherence script message to patient with Diabetes?
4. Would the script message reminder be helpful in decreasing the rate of drug misses by patients?
5. Would the script message reminders be helpful in increasing the number of times patient takes their medications?
6. Would the script messaging drug reminders be helpful in decreasing the number of doctor visit by patients due to nonadherence to medication?
7. Would you be willing to use a telephone reminder system in the future to help your patients manage their diabetes?
8. Would you recommend a telephone reminder system to your friends/family that has diabetes?
9. Would you recommend another health care providers to adopt this program
10. What section of this script messages did you disagree with?
11. Is the script structured and design properly for the drug telephone drug reminder Adherence? If not please explain Why?
12. How well did this script help you in understanding the telephone script message for drug adherence?
13. How well did the script design assist you in establishing the understanding of the usefulness of this telephone reminder script program?
14. Please list the weakness (es) of the design of this script. Please list suggestions for improvement.
15. Please list the strength(s) of this script
16. How helpful is this script experience in guiding you through the content?
17. Was this script easy to understand?
18. Do you like the script messaging system?





Expert will recommend telephone reminder system to others	0	0	0	0	0	0	0	0	5	100	0
Expert will recommend telephone reminder system to providers	0	0	0	0	0	0	0	0	5	100	0
Expert disagree with script messages	0	0	0	0	0	0	0	0	5	100	0
section number											
Script structured and design properly	0	0	1	20	0	0	0	0	4	80	0
Script design helped message usefulness	0	0	0	0	0	0	0	0	5	100	0
Script message understanding	0	0	0	0	0	0	0	0	5	100	0
Script design weakness	0	0	0	0	4	80	1	20	0	0	0
Script design strength	0	0	0	0	0	1	20	0	4	80	0
Script experience guide your understanding of contents	0	0	0	0	0	0	0	0	5	100	0
Script easy to understand	0	0	0	0	0	0	0	0	5	100	0
I like the script messaging system	0	0	0	0	0	0	0	0	5	100	0

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